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W. Fowler gives a detailed account of fishes from Hawaii, Tahiti, and Samoa, in the collection of the Academy. Most of these were collected more than sixty years ago by the noted naturalists, Dr. John K. Townsend and Mr. Thomas Nuttall. Others were more recently obtained by Dr. William H. Jones and Dr. Benjamin Sharp.

The new species are the following. From Honolulu: *Lycodontis parvibranchialis*, *Echidna zonata*, *Stolephorus purpureus*, *Synodus sharpi*, *Hemipteronotus copei*, *Brotula townsendi*; from Samoa, *Mugil caldwelli*.

Mr. Fowler is very careful as to his nomenclature and synonymy, a sure sign of good workmanship in systematic zoölogy, and his conclusions seem everywhere tenable. The plates which illustrate Mr. Fowler's paper, eleven species in all, seem accurately drawn, but are not well reproduced.

It may be here noted that the name *Stolephorus* cannot be used for the great genus of anchovies, to which it has been of late years (following Bleeker) applied. Its type, *Atherina japonica* of Houttuyn, from Nagasaki, is not an anchovy, but the very common Japanese silver-sided sardine, *Kibuna-iwashi*, commonly known as *Spratelloides gracilis*. *Stolephorus* should therefore supersede *Spratelloides*. The genus of anchovies called *Stolephorus* should probably stand as *Anchovia*. The single species which Jordan and Evermann set apart under the latter name is probably not generically distinct. Perhaps all these species should be reunited under *Engraulis*, following Günther's view. The tropical anchovies have, however, a smaller number of vertebrae and a firmer texture of body than the species originally called *Engraulis*. I may note also the necessity of returning to *Gymnothorax* Bloch instead of *Lycodontis*. D. S. J.

**Miall and Hammond's Harlequin Fly.**<sup>1</sup>—This is a book about an animal that has figured prominently in histological work for a generation. It is a book that is intended to facilitate the study of *Chironomus*, especially for inland naturalists, to whom it is so readily available, by setting forth in detail its habits and life history, presenting a résumé of the studies hitherto made of it (chiefly on its salivary glands and its embryology), and adding many new and more or less interesting facts and observations. The chapter headings are as follows: Outline of Life History, and Relations of *Chironomus* to Other Diptera; the Larva of *Chironomus*; the Fly of *Chironomus*;

<sup>1</sup> Miall, L. C., and Hammond, A. R. *The Structure and Life History of the Harlequin Fly (Chironomus)*. Oxford, The Clarendon Press. 8vo, iv + 196 pp., 129 figures.

The Development of the Pupa and Fly within the Larva; The Pupa of Chironomus; and The Embryonic Development of Chironomus. To this is added a brief appendix on methods, likewise intended to promote the use of Chironomus as a laboratory subject. The numerous figures are well selected and useful, but in their execution the best of them do not rise above mediocrity.

Incidentally there is described (on page 34) and figured the larva of Clinocera (Fam. Empididæ), a new type of dipterous larva with eight pairs of prominent abdominal prolegs.

J. G. N.

**Reactions of Protozoa.**—In the Supplementband for 1900 of the *Archiv für Anatomie und Physiologie*, August Pütter<sup>1</sup> presents a most valuable contribution to our knowledge of the reactions of unicellular organisms. The fact that the reactions of these creatures to various stimuli are profoundly modified when the organism is in contact with a solid, is strikingly evident to any one that has studied the behavior of the Protozoa. Pütter has subjected to a thorough analysis this effect of contact of solids (thigmotaxis) and its interference with the operation of other stimuli, and the results form a contribution, an acquaintance with which is indispensable to all who wish to obtain an understanding of the behavior of these creatures. Exact observation of the actual movements of the organisms, close attention to the interrelation of structure and function, and careful analysis of the various factors involved, form the striking and valuable features of the paper, which stands in refreshing contrast in this respect to some of the recent papers dealing with the reactions of lower organisms. The paper is so full of detail, and casts light on so many observed phenomena, that it is impossible to give an idea of the results in a brief notice. In addition to a precise account of the thigmotactic reaction itself, the author deals particularly with the reactions to heat and to the electric current, as modified by the thigmotactic reaction. The observations on electro-taxis are in accord, in all essentials, with those set forth by Pearl in the *American Journal of Physiology* for July, 1900, and throw some additional light on this subject, especially on the subject of *transverse* electro-taxis. Attention may be further called to the fact that Pütter confirms for many Infusoria the method of reaction to a stimulus by turning toward a structurally defined side, as described by the reviewer.

<sup>1</sup> Pütter, August. Studien über Thigmotaxis bei Protisten, *Archiv für Anatomie und Physiologie*, Physiologische Abteilung, Supplementband, 1900, pp. 243-302.